

Example of DTMF commands used by the repeater/transponder UHF/VHF

F5ZPY – 78

Constitution of the repeater F5ZPY :

- Duplex UHF repeater with fixed and shifted receive/transmit frequencies.
- VHF transponder using a TM-D700. Stand-by frequency is 145.400 MHz (simplex). This VHF transponder may be switched to the receive/transmit frequencies of another VHF distant repeater, say 145.650 MHz as receive frequency and 145.050 Mhz as transmit frequency (shift –600 KHz). Then the VHF transponder of F5ZPY acts as a normal user of this distant VHF repeater. The great difference is that users of the F5ZPY UHF repeater will be retransmitted on this distant VHF repeater through the VHF transponder (gateway) of F5ZPY and can start QSOs with the users of this distant VHF repeater.

The F5ZPY repeater is managed by SIMPLEX and its TM-D700 is managed by INTERCOMTMD700. The programs talk together through the TCPIP link of the SIMPLEX server.

Remember that only SIMPLEX decodes DTMF tones. But these tones are used by both SIMPLEX and INTERCOMTMD700. Then we must be very carefull about the definition of the DTMF sequences so that no interference occurs between the two programs.

What do we need ?

SIMPLEX side :

- A DTMF code to inhibit the VHF transponder before changing its frequency. This is mandatory because the TM-D700 needs to be in receive mode when changing its working frequency. Moreover, when changing a frequency, first thing is to listen before transmit ! *We have chosen the character * associated to the action 43* (the transponder is connected to the right channel of the sound card)
- A DTMF code to enable the VHF transponder if we want to converse with a user of the distant VHF repeater which is interconnected. *We have chosen the code 77 associated to the action 44*
- A DTMF code to verify that the new working frequency of the TM-D700 is correct. *We have chosen the code 61 associated to the action 61*
- Other optional codes (SYSOP decides !) :
 - A code to inhibit the K if we don't want this K to be retransmitted in the distant repeater. *(action 27)*
 - A code to enable the K *(action 28)*
 - A code to inhibit the beacon if we don't want that this beacon is retransmitted in the distant repeater. *(action 40)*
 - A code to enable the beacon *(action 41)*
 - A code to put the repeater in transparent mode (no opening tone = *action 09*)
 - A code to make the repeater opens with tone *(action 10)*
 - A code to inhibit the TIMEROOUT *(action 34)*
 - A code to enable the TIMEROOUT *(action 35)*

When creating these optional codes, it is recommended to make them the same length (for example 3 characters) and also make them all starting with the same character (# for example). This will reduce interference risks between themselves.

INTERCOMTMD700 side :

- A code to set the frequency between 144.000 and 144.999 MHz. *We have chosen the code *4 associated to action 11*
 - ex : to set 144.625 MHz, we send **4625*
- A code to set the frequency between 145.000 and 145.999 MHz. *We have chosen the code *5 associated to action 11*
 - ex : to set 145.6125 MHz, we send **4612*

Warning : all frequencies must have been defined in memories other else they won't be taken into account . This test is done in INTERCOM to avoid sending incorrect frequencies (out band for example)!

Before sending codes ,here are a few advises :

- *The DTMF decoding in SIMPLEX is quite simple. Tones must have a minimum 300ms duration and be separated by at least a 300m blank..*
- *If not sure that a code has been correctly decoded by SIMPLEX, let a 6-seconds delay for automatic reset of the current DTMF sequence in SIMPLEX and INTERCOMTMD700, then re-send your code.*

- *When sending 2 successive codes at destination of 2 different programs (one code for **SIMPLEX** and the next one for **INTERCOM**) it is mandatory to wait 6 seconds before sending the second code to let the current sequence reset in both programs.*

Sequence example :

We want to interconnect F5ZPY with a distant VHF repeater which output frequency is 145.650 Mhz and shift is -600KHz. It is assumed that a memory of the TM-D700 contains this frequency associated with this shift. We send the following sequence of DTMF codes :

-*5650 : the first character * is decoded by **SIMPLEX** as action 43 “disable the right channel emitter”. The VHF transponder (TM-D700) is then in receive mode. The next characters 5650 are not recognised by **SIMPLEX** as a valid code. At the same time, the full code *5650 is recognised by **INTERCOM** as action 11 “switch to frequency 145.650 MHz”.

-Wait 6 secondss : to reset the current code in **SIMPLEX**

-61 : decoded by **SIMPLEX** as action 61 “read the actual frequency of the TM-D700”.

- **SIMPLEX** spells the frequency value on the air.

-77 : decoded by **SIMPLEX** as action 44 “enable transmitting on the VHF transponder” (here the 6 seconds delay is not necessary because the successive codes 61 and 77 are both assigned to **SIMPLEX**).

.....QSO can start between F5ZPY users and the distant VHF repeater users.....

To go back to the stand-by frequency of the F5ZPY transponder (145.400 MHz). It is assumed that a memory of the TM-D700 contains this frequency :

-*5400 : the first character * is decoded by **SIMPLEX** as action 43 “disable the right channel emitter”. The VHF transponder (TM-D700) is then in receive mode. The next characters 5400 are not recognised by **SIMPLEX** as a valid code. At the same time, the full code *5400 is recognised by **INTERCOM** as action 11 “switch to frequency 145.400 MHz”.

-Wait 6 secondss : to reset the current code in **SIMPLEX**

-61 : decoded by **SIMPLEX** as action 61 “read the actual frequency of the TM-D700”.

- **SIMPLEX** spells the frequency value on the air.

-77 : decoded by **SIMPLEX** as action 44 “enable transmitting on the VHF transponder” (here the 6 seconds delay is not necessary because the successive codes 61 and 77 are both assigned to **SIMPLEX**).

This last sequence may be defined in the automatic REINT sequence. It will then be automatically sent by **SIMPLEX** after an inactivity period of 10 minutes (value to chosen by the system operator).